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New lichenicolous fungi records for Kyrgyzstan, Uzbekistan, and Ukraine

Olga Nadyeina[1]& Mehmet Gökhan Halici[2*]

[1]*M.G. Kholodnyi Institute of Botany, National Academy of Science of Ukraine, Tereschenkivska str., 2, 01601 Kyiv, Ukraine*

[2]*Erciyes Universitesi, Fen Edebiyat Fakültesi, Biyoloji Bölümü, 38039 Kayseri, Turkey*

Correspondence to *: [1]*nadyeina@gmail.com* & [2*]*mghalici@erciyes.edu.tr*

Abstract — *Gemmaspora lecanorae* and *Rosellinula haplospora* are newly reported for Uzbekistan (Asia), *Rosellinula frustulosae* for Kyrgyzstan (Asia), and *Muellerella ventosicola* and *Weddellomyces heterochrous* for Ukraine (Europe). The different ascospore sizes reported for *W. heterochrous* are also briefly discussed.

Key words — *Ascomycota*, cephalothecioid plates, lichens

Introduction

More than 1500 species of lichenicolous fungi had been described by 2003 (Lawrey & Diederich 2003), and 3000–4000 are estimated worldwide (Hawksworth 2001). Lichenicolous fungi have been one of the least explored fungi because of the inadequate literature and a confused taxonomy based largely on nineteenth century concepts (Hawksworth 1983). But with the recent publication of new keys (Foucard 2001, Nash et al. 2004, Halıcı 2008, Ihlen & Wedin 2008) and checklists (e.g. Kocourková 2000, Diederich & Sérusiaux 2000, Scholz 2000, Faltynowicz 2003, Hawksworth 2003), these organisms have started to receive more attention. Here, we report new records of lichenicolous fungi for Ukraine (Europe) and Kyrgyzstan and Uzbekistan (Asia).

Material & methods

Specimens reported are deposited in KW (Kyiv, Ukraine) or KHER (Kherson, Ukraine). Specimens were examined with a Leica DM 1000 research microscope. Microphotographs were taken with a Leica DFC 420 digital microscope camera with c-mount interface and with a 5 megapixel CCD. Sections were prepared by hand and examined in Merck Lugol's iodine (I) and water. Ascospores were measured in water.

Ascospores and asci measurements are given by the arithmetic mean flanked by the mean ± standard deviation and parenthetical minimum and maximum values. All measurements and ratios include the halo in ascospores. The length/breadth ascospore ratio is indicated as l/b.

Taxonomy

Gemmaspora lecanorae (Werner) D. Hawksw. & Halıcı

A detailed description is provided by Hawksworth & Halıcı (2007).

The species is lichenicolous on the thallus of *Aspicilia* species and evidently commensalistic, as no damage or discoloration was observed in the host thallus. Perithecia are black, >300 µm wide, semi-immersed to almost superficial. Asci are 8-spored and ascospores (0–)1-septate, with very thick cell walls, which are 2-layered, and very broadly ellipsoid to globose, (12–)12.5–13–14 × 8.5–9 µm with l/b ratio (1.35–)1.4–1.5–1.6(–1.65).

Gemmaspora lecanorae was previously known from just two localities: Syria, on the thallus of *Aspicilia* cf. *farinosa*, and Turkey, on the thallus of *Circinaria calcarea* (L.) A. Nordin & al. (Hawksworth & Halıcı 2007). New to Uzbekistan on *A. thjanschanica* Oxner.

UZBEKISTAN. Tashkent region, Western Tian'-Shan', Velykyi Chymgan Mountain, 1800 m alt., granite outcrop, on the thallus of *Aspicilia thjanschanica* with *Rosellinula haplospora*. A. Lazarenko, 28.09.1929 (KW 23638, isolectotype of *Aspicilia thjanschanica*).

Muellerella ventosicola (Mudd) D. Hawksw.

A detailed description (as *M. pygmaea* var. *ventosicola*) is provided by Triebel (1989) and Triebel & Kainz (2004).

The species is lichenicolous on the thallus of on a wide range of crustose saxicolous lichens including *Rhizocarpon*, *Ophioparma,* and *Protoparmelia* (Triebel 1989, Ihlen & Wedin 2008, Halıcı 2008) and apparently commensalistic, as no damage or discolouration was observed in the host thallus. Ascomata perithecioid, black, semi-immersed, 250–300 µm. Asci (20–)50-spored, 50–55 × 15 µm. Ascospores brown, thick-walled, 1-septate, 6–7.5–9(–10) × 4–4.5–5 (–6) µm, l/b ratio (1.3–)1.4–1.6–1.8(–2).

Muellerella ventosicola grows on *Rhizocarpon geographicum* (L.) DC. and *R. grande* (Flörke ex Flot.) Arnold. New to Ukraine

UKRAINE. Zakarpattia (Transcarpathian) Region, Rakhiv district, Svydovets, Blyzhnytsia Mountain, 1500 m alt., on the thallus of *Rhizocarpon grande*, M. Makarevych, 11.07.1947 (KW 27534). Zaporizhzha Region, Chernigyvskyi district, Novopoltavka Village, Synia outcrop, on the granite, on the thallus of *R. geographicum*, O. Khodosovtsev, 02.10.2007 (KHER 1469).

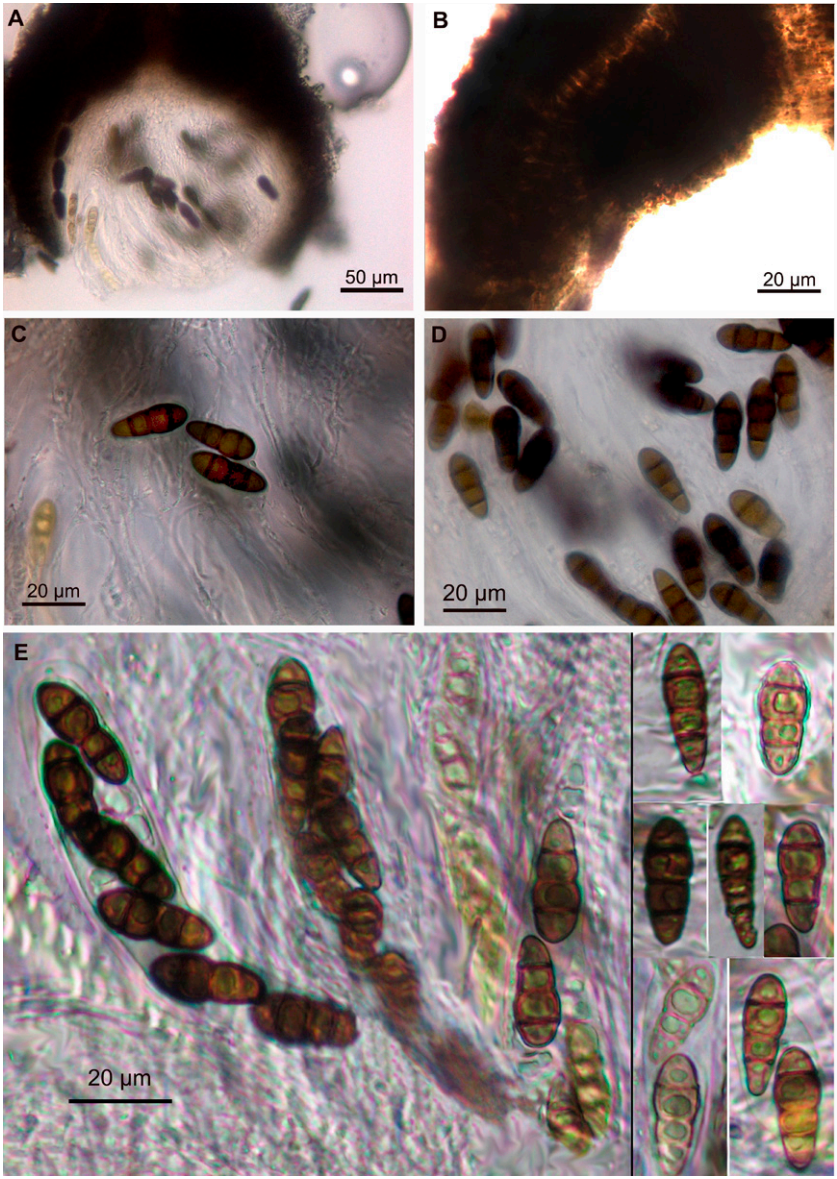

Fig. 1. *Weddellomyces heterochrous*. A, Perithecium; B, Cephalothecioid plates; C, Ascospores and pseudoparaphyses; D, Ascospores; E, 6-spored and 8-spored asci; F, Ascospores.

Rosellinula haplospora (Th. Fr. & Almq.) R. Sant.

A detailed description is provided by Hafellner (1985).

The species has previously been reported as lichenicolous on the thalli of *Circinaria caesiocinerea* (Nyl. ex Malbr.) A. Nordin et al., *Aspicilia cinerea* (L.) Körb., *A. intermutans* (Nyl.) Arnold, and *Bellemerea alpina* (Sommerf.) Clauzade & Cl. Roux (Hafellner 1985; Ihlen & Wedin 2008; Halıcı 2008). It is evidently commensalistic, as no damage or discolouration was observed in the host thallus of our collections, where it grew together with *Gemmaspora lecanorae* and *Lichenostigma elongatum* Nav.-Ros. & Hafellner (on *Aspicilia* spp.). Ascomata perithecia 200–230 µm, 20–50 spores per ascus, (5–)6–6.5–7.5(–8) × (4–)4.5–5–5.5(–6) µm, with l/b ratio (1–)1.1–1.3–1.5(–2).

New to Uzbekistan on *Aspicilia thjanschanica* and *Aspicilia* species in our report.

UZBEKISTAN. Tashkent region, Western Tian'-Shan', Velykyi Chymgan Mountain, 1800 m alt., granite outcrop, on the thalli of *Aspicilia thjanschanica* and *Aspicilia* sp. A. Lazarenko, 28.09.1929 (KW 23638, isolectotype of *Aspicilia thjanschanica*).

Rosellinula frustulosae (Vouaux) R. Sant.

A detailed description is provided by Hafellner (1985).

The species is lichenicolous on the thallus of *Lecanora frustulosa* and *L. argopholis* and evidently commensalistic, as no damage or discolouration was observed in the host thallus. Perithecia, 220–280 µm, c. 100 spores per asci. Spores (4.5–)5.5–6–7(–7.5) × (3.5–)4–4.5–5(–6) µm, with l/b ratio (1–)1.1–1.3–1.5(–1.8).

Rosellinula frustulosae is specific to *Lecanora frustulosa* (Dicks.) Ach. and *L. argopholis* (Ach.) Ach. (Hafellner 1985). New to Kyrgyzstan on *L. argopholis*. Although we have no fresh collections from Ukraine, the holotype was collected from a *L. frustulosa* thallus by K. Mereschkowsky near Simpheropol in Crimea (Hafellner 1985). This is still the only known Ukrainian locality of this species, but it has not yet been reported in Ukrainian check-lists (Kondratyuk at al. 1998, Kondratyuk at al. 2010).

KYRGYZSTAN. Issyk-Kul', Pokrovka, Kyrgyz Station, Institute of Geography AS USSR, in the river valley, on the thallus of *Lecanora argopholis*, on granite. Sobol', 15.07.1947 (KW 3898 – specimen is kept under name "*Rhizocarpon geographicum*").

Weddellomyces heterochrous Nav.-Ros. & Cl. Roux Figure 1

A detailed description is provided by Navarro-Rosinés & Roux (1995).

The species is lichenicolous on the areoles of *Aspicilia* and *Circinaria* species and causes a slight bleaching in the infected parts. It is weakly parasitic. The following description is based on our collection on *Aspicilia contorta* subsp. *hoffmanniana* S. Ekman & Fröberg ex R. Sant.

Asci cylindrical or largely cylindrical clavate, (110–)111–*113*–115(–118) × (18–)19.5–*20.5*–21.5(–25) µm (*n* = 20), 4–6–8-spored, wall gradually thickened towards the apex, I–, ocular chamber present. Ascospores 3-septate, brown, terminal cells concolorous with central cells, surface smooth, halonate, halo ~1 µm, slightly constricted at the septa, but sometimes strongly constricted in the middle septa, heteropolar, uniseriate or irregularly biseriate in the asci, (21–)23–*25*–27(–28) × (8–)9–*9.5*–10(–11) µm (*n* = 40), l/b = (2.2–)2.4–*2.6*–2.8(–3.1) The ascospore sizes in our data and cited in the literature seem very variable. In the original description, based on a single type on *Circinaria calcarea,* the ascospores (primarily 3-septate) measure (25–)26.5–*30.4*–35.5(–38) × (10–)11–*12*–13.5(–14.5) µm (Navarro-Rosinés & Roux 1995). In a Turkish collection on an *Aspicilia* species, the ascospores measured (32–)36–40 × 11–13 µm (Halıcı et al. 2007). More collections are needed to reassess the ascospore size and host variations and to determine whether more than a single taxon exists.

New to Ukraine.

UKRAINE. Luhans'k Region, Pereval's'k district, steppe slope between Mikhailivka and Troits'ke Villages above Isakiivs'ke water storage, on thallus of *Aspicilia contorta* subsp. *hoffmanniana* on limestone outcrop, O. Nadyeina 09.04.2007 (KW 68135).

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